CASE REPORT

Giant epidermal cyst with intramuscular extension: a rare occurrence

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SUMMARY

An epidermal cyst is the most common type of cyst to occur in subcutaneous tissue. When its size is greater than 5 cm, it is recognised as a giant epidermal cyst. A subcutaneous giant epidermal cyst with intramuscular extension is extremely rare. The authors report a case of a 74-year-old man who presented with a painless, slow-growing left gluteal mass of 6-month duration. Examination revealed a large left gluteal mass that was fixed to the underlying structures. A small epidermal cyst with visible punctum was noted at the medial aspect of the mass. MRI demonstrated a large, lobulated left gluteal lesion measuring 20 cm×16 cm×10 cm. The lesion was partly within the gluteal maximus muscle and partly within the subcutaneous tissue. MRI and ultrasound features of the lesion were consistent with a giant epidermal cyst with intramuscular extension. The lesion was excised and histology confirmed the diagnosis.

BACKGROUND

An epidermal cyst is the most common type of cyst to occur in the subcutaneous tissue. Generally, the size of an epidermal cyst is less than 5 cm.¹ When its size is greater than 5 cm, it is recognised as a giant epidermal cyst. An epidermal inclusion cyst of the digit with erosion into the underlying distal phalanx is a well-known finding. However, a subcutaneous giant epidermal cyst with intramuscular extension is extremely rare and has not been reported in the literature. We report a case of a giant epidermal cyst with intramuscular extension. Preoperative assessment via ultrasound and MRI is highly accurate to make the diagnosis.

CASE PRESENTATION

A 74-year-old Chinese man with no known comorbidities presented with a painless left gluteal mass of 6-month duration. He was not aware of the mass until he experienced a vague sensation originating from the left gluteal region when sitting down. Subsequently, he noted the mass was slowly increasing in size. However, he denied history of local pain, discharge or referred pain to the lower extremity. Owing to the fear of a cancerous growth, he gradually lost his appetite and shed 6 kg in weight. There was no history of cough, fever or altered bowel habit. He is a non-smoker and does not consume alcohol. Inspection of the gluteal region revealed marked enlargement of the left gluteus without definite distortion of the surface anatomy. On palpation, there was a large left gluteal mass that was firm to hard in consistency

and fixed to the underlying structures. It was non-tender on palpation. There was no discolouration of the overlying skin except for presence of a small epidermal cyst with visible punctum noted at the medial aspect of the mass measuring 3 cm×3 cm in size. The skin overlying the sebaceous cyst appeared hyperpigmented. The rest of the patient's systemic examination was within normal limits.

INVESTIGATIONS

The blood investigations and tumour markers were unremarkable. In view of the enormous size of the mass, the constitutional symptoms of weight loss and poor appetite as well as the patient's advanced age group, a diagnosis of soft tissue sarcoma was made. MRI was performed for further characterisation of the tumour prior to biopsy (figures 1 and 2). MRI demonstrated a large well-defined and lobulated lesion occupying the left gluteal region measuring 20 cm×16 cm×10 cm. The lesion was hypointense on T1-weighted images and displayed mixed hyperintense signal on T2-weighted images. There were a few septations and multiple internal debris within. The internal debris was hypointense on T2-weighted images and hyperintense on T1-weighted fat-saturated images. The lesion was partly within the gluteal maximus muscle and partly within the subcutaneous tissue. It was predominantly margined by the stretched gluteus maximus muscle, giving rise to the 'claw sign'. Superficially, the lesion was connected to a small epidermal cyst, which was noted during physical examination. There were no inflammatory changes and no altered signal intensity of the adjacent subcutaneous fat, muscle and bone. Thin and smooth wall enhancement of the lesion was demonstrated postgadolinium. The content of the lesion was non-enhancing. A complimentary ultrasound of the mass showed a mildly echogenic lesion with coarse echotexture. Multiple hypoechoic and echogenic flakes were seen within (figure 3). No vascularity was demonstrated within the mass. MRI and ultrasound features of the lesion were consistent with a giant epidermal cyst with intramuscular extension. Soft tissue sarcoma was excluded.

TREATMENT

In view of the imaging findings, the patient was subjected to excision of the lesion without preoperative trucut biopsy. Intraoperatively, the cyst was largely encapsulated and adherent to the gluteal maximus muscle. A small area of the cyst was attached to the skin. The cyst was completely excised. Soft brownish flaky material was noted within the cyst.

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Figure 1 MRI sagittal T2-weighted images demonstrating a well-defined lobulated hyperintense lesion with multiple hypointense internal debris within, suggestive of a thick content complex cyst. The lesion is partly margined by the stretched gluteal maximus muscle (asterisk) giving rise to the 'claw sign', which indicates an intramuscular location. A septa (black arrow) is seen within the lesion. Dorsally, a small epidermal cyst (white arrow) connects the giant complex cyst to the skin.

The histological examination showed a large cystic lesion lined by stratified squamous keratinising epithelium. The cavity of the cyst was filled with lamellated keratin flakes. The cyst wall measured about 1 mm in thickness and was infiltrated by chronic inflammatory cells. No malignancy was noted at the cyst wall. The histology confirmed the diagnosis of an epidermal cyst.

OUTCOME AND FOLLOW-UP

Postoperatively, the patient recovered uneventfully and was well during the subsequent follow-up at the clinic.

Figure 2 MRI axial view shows the complex cyst (asterisk) to be hypointense on T1-weighted image (A) and hyperintense on T2-weighted image (B). A small superficial epidermal cyst (arrow), which was noted on clinical examination, is seen communicating with the giant complex cyst.

DISCUSSION

Subcutaneous epidermal inclusion cysts are relatively common lesions comprising about 85–90% of all excised subcutaneous cysts.² They usually arise on hair-bearing areas such as the scalp, face, neck, trunk, extremities and scrotum. The clinical diagnosis of a subcutaneous epidermal cyst is usually uncomplicated, especially when it is associated with a punctum. However, the enormous size of a giant epidermal cyst may mimic a soft tissue sarcoma, requiring further evaluation with imaging studies.

The combination of MRI and ultrasound is highly accurate to diagnose epidermal cysts due to its distinct imaging features. It was reported that the imaging features of an epidermal cyst are determined by the degree of cyst maturation, its concentration and the amount of keratin.³ On MRI, it is well encapsulated and exhibits hypointense signal on T1-weighted image. On T2-weighted image, it is hyperintense to intermediate in signal intensity with multiple hypointense internal debris, which are

Figure 3 Ultrasound of the left gluteal region shows a mildly echogenic lesion with coarse echotexture. Multiple hypoechoic and echogenic flakes are present within.

seen in 43% of cases.⁴ On T1-weighted fat-saturated images, the cyst content remains hypointense but the debris may appear hyperintense, as seen in the present case. A benign epidermal cyst shows thin wall enhancement. It is a unilocular cyst in the majority of cases. Septations, thick irregular rim enhancement and perilesional enhancement may be demonstrated in a ruptured epidermal cyst.⁵

Diagnosis based on ultrasound alone is challenging as the sonographic appearance of the lesion mimics a solid lesion to the inexperienced eye. Differing from a simple cyst, which appears anechoic on ultrasound, it is slightly echogenic with mixture of echogenic and hypoechoic debris within. A recent study had described the sonographic and MR features of superficial epidermal inclusion cysts in 79 participants. The cyst content is heterogeneous and mildly echogenic in 66 cases (92%) while the presence of internal debris within the cyst accounted for 43% of cases.⁴ The scattered short tubular echogenic reflections were attributed to the layered and aggregated keratin debris and the tubular hypoechoic areas represent cyst-like spaces and areas devoid of keratin.⁶

The majority of epidermal cysts are confined to the subcutaneous tissue. Invasion of an epidermal cyst to the surrounding structures is uncommon. A notable exception is an epidermal inclusion cyst of the digit with erosion into the underlying distal phalanx. Intramuscular extension of an epidermal cyst is a rare occurrence and, to the best of our knowledge, has not been reported in any literature to date. In the present case, a small epidermal cyst was detected on physical examination but was misconstrued as an isolated lesion until further revelation on MRI. We postulate that the clinically visible small epidermal cyst was the original lesion and confined to the subcutaneous tissue initially. The lesion was complicated by secondary infection, giving rise to an inflammatory response in the surrounding tissues. The ventral wall of the epidermal cyst adjacent to the gluteus muscle had probably ruptured resulting in further inflammatory reaction within the muscle. Consequently, the epidermal cyst had infiltrated the gluteus maximus muscle and insidiously increased in size within the muscle. The presence of septations without perilesional inflammation on MRI was suggestive of a non-recent rupture of the cyst. As the cyst expanded, it had stretched the gluteal muscle fibres giving rise to the 'claw sign', as evidenced on MRI. Despite the short duration of presentation, we believe the lesion was present for years and was slowly increasing in size.

Rarely, an epidermal cyst may undergo malignant transformation.⁷ Therefore, MRI is important to look for evidence of any enhancing soft tissue component or irregular enhancing mural thickening. Histological assessment is vital to make the final conclusion.

Complete excision of the sac and its contents is the treatment of choice for an epidermal cyst. Incomplete removal of the cyst can lead to chronic inflammation and recurrence.¹ Nonetheless, a 3% recurrence rate is possible despite complete removal of the cyst.⁸

Learning points

- ▶ An epidermal cyst can grow into an enormous size, mimicking a soft tissue sarcoma.
- ▶ A ruptured epidermal cyst potentially exerts inflammatory reaction in the adjacent structures and extends into the underlying musculature, forming an intramuscular epidermal cyst.
- ▶ A combined MRI and ultrasound study of the epidermal cyst is highly accurate to elicit the diagnosis prior to surgery.

Contributors SFL conceived the study and was responsible for the design, drafting, writing, editing and finalising the manuscript. RS edited the manuscript and wrote the summary. CSN edited and finalised the manuscript.

Competing interests None.

Patient consent Obtained.

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